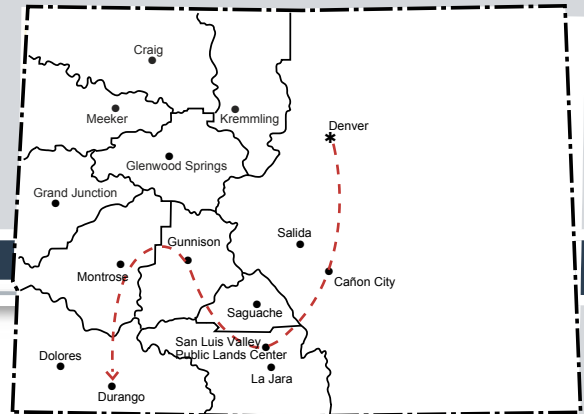


# COLORADO

## San Juan Public Lands Center



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## BLM Colorado and Forest Service Restore Rivers Polluted by Abandoned Mines

By Stephanie Odell, Ann Bond, and Alexa Bainbridge

A car rambles slowly along a Colorado dirt road while the passengers admire the tall evergreens and mountain views. The sky is blue and the sun is shining brightly on the public lands managed jointly by the Bureau of the Land Management (BLM) and the Forest Service. A break in the trees reveals a large area covered with rocks, an old mining structure that looks like it might have once been a cabin, and a small pond. The scene is peaceful and seems harmless, but not too long ago this old mine discharged polluted water into the area's streams and rivers, significantly impacting aquatic plants, fish and insects. Because of a mine cleanup program, the BLM and Forest Service have been able to significantly reduce the pollutants from some abandoned mines in the area.

In 1995, Congress identified two watersheds in the nation as pilot projects for abandoned mine reclamation. One of these projects was the upper Animas River watershed in Colorado. There are over 1,500 abandoned mines located and inventoried in the area. There are an estimated additional 3,000 mines under private ownership in the basin as well. The San Juan Public Lands Center Abandoned Mined Lands (AML) Program works closely with the Animas River Stakeholders Group (ARSG) and Colorado Water Quality Control Commission to prioritize which sites are selected for clean up. BLM and Forest Service projects are managed through the San Juan Public Lands Center.

The Colorado Water Quality Control Commission designated the water quality of the Animas River and its tributaries in the upper Animas watershed as impaired for aluminum, cadmium, copper, iron, lead, and zinc. In order to restore the quality of the Animas River, the BLM and Forest Service and our partners in the ARSG, have completed several AML projects in the San Juan Mining District. BLM's most recent project at the Elk Tunnel settling ponds included, a \$145,000 project that significantly reduced discharge of heavy metals into the Cement Creek tributary of the Animas, and a \$360,000 mine



MINE RUNOFF INTO CREEK BEFORE PROJECT BEGAN.





waste removal project at the Brooklyn Mine on national forest lands which drains into the Mineral Creek tributary.

Testing showed that discharge from the Elk Tunnel, located northwest of Silverton, was loaded with arsenic, aluminum, iron, manganese, zinc, and silver. In fact, iron and zinc concentrations exceeded Environmental Protection Agency (EPA) water-quality standards for aquatic life. The polluted water also posed potential public-safety risks, because the Elk Tunnel is adjacent to a Colorado state highway and readily accessible to visitors. Arsenic, manganese, and iron concentrations in the discharge exceeded EPA water quality standards for human consumption.

Last summer, the BLM went to work on correcting these problems.

But how did the BLM clean the water draining from these abandoned mines? First, a series of three settling ponds, lined with limestone and connected by limestone line ditches, were created to separate the minerals from the water. The polluted water runs from the mine and hits the settling ponds. At this point the minerals precipitate out of the water due to a chemical reaction with the limestone, and the cleaner water runs out of the pond and into the streams. After a few years, the heavy metals and limestone are removed from the settling ponds and are taken from the area and put in land fills or buried. Then the process begins again by replacing the limestone. The result is a significant reduction in the acidity of the mine drainage and in the amount of minerals running into Cement Creek and the Animas River.

The Brooklyn Mine drainage problem was similar to that of the Elk Tunnel, but in addition to the drainage problem, the mine waste dumps were very large and sulfidic, meaning as precipitation and the mine drainage percolated through the mine waste, sulfuric acid was generated that leached large amounts of heavy metals out of the waste rock and into the environment. There also was a large mining related mining hole at the Brooklyn Mine that posed a safety threat to humans and wildlife. Waste rock from the waste dumps was used to fill in the mining hole and secured with a cap layer, while the acidic mine drainage was diverted away from the waste rock and discharged onto a bench of calcite bearing native rock that buffers the acid and neutralizes the drainage before it flows into the Mineral Creek tributary.

Four other mine sites in the Silverton area have been cleaned up through the San Juan's AML Program since 1997. They include the Forest Queen Mine, Lackawanna Mill, and May Day and Henrietta Mines. Three more projects are scheduled for next year: the Lark Mine, Joe and John's Mine, and the Kansas City Group. BLM and Forest Service also have long range plans for several other mines located on public lands and some projects that we are working on with private landowners to improve the health and safety of directly impacted public lands.





San Juan County has a colorful and cyclic hardrock mining history, and this rich history has become an integral part of the community culture. Some 17.4 million tons of ore were produced during alternating periods of productivity and shutdown over 130 years of mining activity. Gold, silver, copper, lead and zinc ores were the economic minerals mined in the area. The rich ore deposits are a result of immense volcanic activity centered in the San Juan Mountains millions of years ago. You can enjoy some of the area's mining history while driving along the Alpine Loop National Scenic Byway. There are ghost towns and old mills that you can view with interpretative signs explaining their history.

So come take a drive through our public lands and learn about our mining history with the knowledge that the BLM and Forest Service are working together to ensure the quality of human and aquatic life along Colorado's rivers.

For more information please contact Stephanie Odell, the San Juan Public Lands Center Abandoned Mined Lands Program Coordinator, at 970-385-1353 or External Affairs Specialist Ann Bond at 970-385-1219.